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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,712	03/10/2004	Karsten Heuser	12406-083001 / P2003,0150	5002
26181 7590 11/09/2011 FISH & RICHARDSON P.C. (SV) PO BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER VETERE, ROBERT A	
			ART UNIT 1712	PAPER NUMBER
			NOTIFICATION DATE 11/09/2011	DELIVERY MODE ELECTRONIC

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/798,712
Filing Date: March 10, 2004
Appellant(s): HEUSER ET AL.

Sean M. Dean
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 8/22/11 appealing from the Office action mailed 3/10/11.

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(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1-3, 6, 7, 10-15 and 17-31 are pending and rejected. Claims 4, 5, 8, 9 and 16 have been withdrawn from consideration.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

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(8) Evidence Relied Upon

2003/0203210 GRAFF ET AL. 10-2003

6,522,067 GRAFF ET AL. 02-2003

Komada, Japanese Patent 2001-277420, March 2000.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 6, 7, 10-15, 17-26, 28 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Graff et al. (US 2003/0203210).

Claims 1, 28 and 31: Graff teaches barrier coatings and methods of making the same.

Specifically, Graff teaches depositing three plies of aluminum oxide onto the substrate, followed by a plasma treatment (i.e. forming a first ceramic barrier layer on a substrate, wherein the first ceramic barrier layer has a first surface and a second surface and the first surface is closer to the substrate than the second surface; forming a second ceramic barrier layer directly on the second surface of the first ceramic barrier layer) [0088]. A portion of the second surface of the first ceramic barrier layer is modified to introduce first nucleation sites on the second surface via plasma treatment [0065, 0073]. Graff further discloses that the composite structure of the plies of the layers may compensate for unavoidable defects because defects in one ply will generally be blocked by the subsequent overlying ply (inherently, the first ceramic barrier layer and the second ceramic barrier layer together have enhanced barrier capabilities against gas and liquid as compared to similar adjacent ceramic barrier layers formed without the

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modifying step to introduce nucleation sites ([0079]; [0088]-[0092]; see fig. 3). Graff also explains that the plasma treatment causes the surface of the barrier layer to undergo structural and chemical modifications which improve surface conditions for subsequent deposition (claimed second surface comprises a material different from the first surface) (§ 0082).

Claims 2-3: Graff teaches chemical modification by the use of a plasma treatment ([0065], [0073], and [0088]).

Claims 6-7 and 10-11: Graff teaches multi-ply barrier layers that may comprise metal nitrides and metal oxides such as titanium oxide and tantalum oxide, (i.e. applying material with a critical nucleus of one molecule) [0043]. Furthermore, as multiple plies are deposited, the very first trace of the metal oxide or nitride hitting the surface of the ceramic barrier layer would inherently form a nucleation promoting material on at least a portion of a previously deposited ceramic layer.

Claims 12-15 and 17: Graff teaches forming first and second ceramic barrier layers comprising aluminum oxide and silicon nitride, and may be deposited by chemical vapor deposition ([0043], [0071]).

Claim 18: Graff discloses the use of a flexible transparent substrate [0040].

Claim 19: Graff teaches modifying at least a portion of the second surface to introduce second nucleation sites on the second surface of the second ceramic barrier layer; and forming a third ceramic barrier layer on the second ceramic barrier layer, wherein the third ceramic barrier layer is inherently initiated at the second nucleation sites ([0023]—[0024]).

Claims 20-23: Graff teaches the barrier layers (i.e. first and second ceramic barrier layers) may have a thickness ranging from 50-500 angstrom (i.e. 5-50 nm and within the claimed range) [0021].

Claims 24-25: Graff teaches forming an environmentally sensitive display device 50 (i.e. OLED) on top isolation layer/ceramic barrier layer 42 by: forming a first electrically conductive layer on the isolation barrier layer 42; forming a functional organic layer 50 on the first electrically conductive layer 52; and forming a second electrically conductive layer 54 on the functional organic layer (see fig. 1b, [0063]). Graff does not explicitly teach forming the organic electrical device on the second ceramic barrier layer; however, it would have been within the level of ordinary skill in the art at the time of the invention to vary

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the number of barrier layers on the substrate in order to effectively guard against atmospheric contaminants without hindering the overall size of the device.

Claim 26: Graff teaches forming an encapsulation 56 over the second electrically conductive layer such that the functional organic layer is sealed from the environment by said encapsulation (see fig. 1b; [0063]).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graff in light of Graff et al. (US 6,522,067).

Claim 27: Graff '210 teaches forming multiple ceramic layers/plies (i.e. third and fourth ceramic barrier layers) wherein at least one layer is plasma treated (i.e. modifying a second surface of a third ceramic barrier layer to introduce second nucleation sites on the surface of the third ceramic barrier layer). Graff '210, however, does not explicitly disclose an encapsulation comprising ceramic barrier layers.

Graff '067 teaches an encapsulated organic light emitting device whereby the barrier stacks 270 and 130 encapsulate the electrically conductive layer/functional organic layer and is comprised of several ceramic barrier layers in order to provide enhanced barrier protection (see fig. 2, col. 3, lines 32-48; col. 4, lines 8-30; col. 5, lines 29-44). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include Graff '067's ceramic barrier containing encapsulation in Graff '210's method in order to provide enhanced barrier protection.

5. Claims 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graff '210 in light of Komada et al. (JP 2001-277420, machine translation).

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Claims 29-30: Graff '210 teaches that the surface of the barrier oxide layer is modified to improve adhesion of subsequently deposited layers, but only expressly teaches plasma treatment to achieve this. Komada teaches a method of modifying barrier oxide layers to produce nucleation sites which improve adhesion of subsequently deposited layers by either plasma treatment or chemical treatment with an acid (¶¶ 0010, 0020, 0039). Thus, because Komada teaches that acid treatment can be used in place of plasma treatment to produce nucleation sites on a barrier oxide layer, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an acid treatment in place of a plasma treatment in the method of Graff '210 with the predictable expectation of success.

(10) Response to Argument

Appellant argues that Graff '210 fails to teach the step of forming a second barrier layer directly on a first barrier layer because Graff '210 only teaches a method of depositing alternating polymer and inorganic layers. This is not compelling. While the examiner agrees that Graff '210 teaches a method of deposition wherein inorganic layers are first deposited followed by organic layers (see, e.g., ¶ 0016), Graff '210 further teaches that a fourth inorganic layer can be deposited directly onto the third inorganic layer without an intervening organic layer (¶¶ 0017-0018).

Appellant also argues that there is not indication in Graff '210 that the fourth inorganic layer can be deposited directly onto the third inorganic layer. This is not compelling. Graff '210 teaches an embodiment wherein the step of depositing the organic layer onto an inorganic layer is skipped and an additionally inorganic (i.e. barrier) layer is deposited directly onto the underlying inorganic layer (¶ 0094). Specifically, in the embodiment described in ¶ 0094, a first inorganic ply is deposited and plasma treated. Subsequently, the rollers rewind the substrate bypassing all application stations (i.e. where the organic layer would have been deposited), apply another plasma treatment and then deposit a second inorganic ply onto the first. Thus, Graff '210 describes a method wherein a second inorganic barrier layer is deposited directly onto a plasma treated (i.e. modified) first inorganic barrier layer.

Appellant further argues that a fourth inorganic layer cannot be deposited on the third inorganic layer because Graff '210 states that the third inorganic layer is the topmost layer at ¶ 0017. This is not

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compelling. The disclosure at ¶ 0017 is referring to one embodiment of the invention. Graff '210, at ¶ 0018, describes another related embodiment where a fourth inorganic layer is also applied.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Robert Vetere/

Examiner, Art Unit 1712

/Michael Cleveland/

Supervisory Patent Examiner, Art Unit 1712

Conferees:

/Michael Cleveland/

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Supervisory Patent Examiner, Art Unit 1700